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10/765,115	01/28/2004	Pamela Saha		9712
James C. Wray Suite 300 1493 Chain Bridge Road McLean, VA 22101				
EXAMINER UNDERWOOD, JARREAS C				
ART UNIT 2877				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/765,115

Applicant(s)

SAHA, PAMELA

Examiner

JARREAS C. UNDERWOOD

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13, 14, 17, 24, 28-30, 43 and 44 is/are allowed.
- 6) ☒ Claim(s) 1-10, 15, 16, 18-23, 25-27, 31, 32, 34-42 and 45 is/are rejected.
- 7) ☒ Claim(s) 11, 12 and 33 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-848)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-45 have been considered but are moot in view of the new ground(s) of rejection.

Examiner's Note

2. Concerning photoelastic materials, examiner cites the following materials as photoelastic with the appropriate reference: Bakelite, celluloid, gelatin, synthetic resins and glass (Reyblatt, United States Patent 4,008,960, column 1, lines 14-17), acrylic (e.g. Plexiglass, Issa and Maamoun, Abstract) , polyvinyl acetate, cellulosic sheet material, polyesters, gelatins (Zandman, United States Patent 3,071,502, column 3, lines 7-25), glass, plastic, Plexiglas, gel candle material and other gels (Saha, United States Patent Application Publication 2006/0087642, paragraph 0067).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In this case, a property of a photoelastic material is that of double refraction, or birefringence. In order to be capable of birefringence, the material must be able to

transmit light, e.g. be transparent or translucent. Opaque objects therefore cannot be photoelastic.

As the specification fails to explain or give examples of how an opaque object may be manipulated to transmit light, examiner relies upon the dictionary definition of opaque: "not clear; not transmitting light or radiant energy", and maintains the position that fringe patterns cannot be seen within opaque materials.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 8, 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "the modulus of elasticity" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, examiner assumes the applicant intends to indicate that the materials that could make up the photoelastic material of claim 1 are to have a different modulus of elasticity.

5. Claim 25 recites the limitation "between embedded objects and the photoelastic material" in line 2. There is insufficient antecedent basis for this limitation in the claim. Neither claim 1 nor claim 25 specify the existence of embedded objects.

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 18-19, 26, 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Flader (United States Patent 3,373,652).

7. As to claim 1, Flader teaches a photoelastic entertainment device comprising deformable photoelastic material (Figure 1, element 15) molded into shapes and one or more light polarizing films Figure 1, elements 12, 13) for viewing fringe patterns within the photoelastic materials caused by stress.
8. As to claim 2, Flader teaches everything claimed, as applied above in claim 1, in addition the shapes are geometric shapes, flexible sheets, prisms, lenses, wedges, cubes, pyramids, amorphous forms, animal or dinosaur shapes (Figure 7, elements 46, 47).
9. As to claim 3, Flader teaches everything claimed, as applied above in claim 1, in addition the photoelastic material is transparent (column 2, lines 35-38).
10. As to claim 18, Flader teaches everything claimed, as applied above in claim 1, in addition the one or more polarizing films (Figure 3, elements 105, 108) are separated and supported by posts (Figure 3, elements 72, 115, 117) disposed between the films.
11. As to claim 19, Flader teaches everything claimed, as applied above in claim 18, in addition a distance separates the films such that a user can manipulate the photoelastic material (Figure 7, elements 46, 47) between the films (Figure 7, elements 76 & 66).
12. As to claim 26, Flader teaches everything claimed, as applied above in claim 1, in addition additional optical effects are used (Figure 1, element 11).

13. As to claim 35, Flader teaches everything claimed, as applied above in claim 1, in addition a separate lens (Figure 1, element 21) is used to view stress patterns.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 4, 7-8, 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flader in view of Zandman (United States Patent 3,071,502).

14. As to claim 4, Flader teaches everything claimed, as applied above in claim 1, with the exception of the photoelastic material is translucent. However to do so is well known as taught by Zandman. Zandman teaches the photoelastic material is translucent (column 3, lines 7-12). It would have been obvious to one of ordinary skill in the art at the time of invention to have the photoelastic material be translucent, in order to take advantage of inherent color properties and remove the need for additional colorizing filters.

15. As to claim 7, Flader teaches everything claimed, as applied above in claim 1, with the exception of the chemical composition of the photoelastic material is variable as long as the material is photoelastic. However to do so is well known as taught by Zandman. Zandman teaches the chemical composition of the photoelastic material is variable as long as the material is photoelastic (column 3, lines 7-25). It would have been obvious to one of ordinary skill in the art at the time of invention to have the chemical composition of the photoelastic material be variable as long as the material is photoelastic, in order to use a material that is best suited to the use of the device.

Art Unit: 2877

16. As to claim 8, Flader teaches everything claimed, as applied above in claim 1, with the exception of the modulus of elasticity is variable. However to do so is well known as taught by Zandman. Zandman teaches the modulus of elasticity is variable (column 3, lines 7-25). It would have been obvious to one of ordinary skill in the art at the time of invention to have the modulus of elasticity is variable, in order to create different internal stress lines.

Examiner's position is that while Zandman fails to explicitly teach choosing materials possessing a different modulus of elasticity, Zandman teaches using different materials, each of which inherently have a different modulus of elasticity.

17. As to claim 36, Flader teaches everything claimed, as applied above in claim 1, with the exception of an applied photoelastic coating. However to do so is well known as taught by Zandman. Zandman teaches an applied photoelastic coating (column 1, lines 22-28). It would have been obvious to one of ordinary skill in the art at the time of invention to have an applied photoelastic coating, in order to examine the stress of an intricate or complex surface.

18. As to claim 37, Flader teaches everything claimed, as applied above in claim 36, with the exception of the applied photoelastic coating is a liquid paint coating or a flexible sheet coating. However to do so is well known as taught by Zandman. Zandman teaches the applied photoelastic coating is a liquid paint coating or a flexible sheet coating (column 1, lines 22-28). It would have been obvious to one of ordinary skill in the art at the time of invention to have the applied photoelastic coating is a liquid

paint coating or a flexible sheet coating, in order to insure all parts of a complex surface are covered.

Claims 6, 15-16, 38-40, 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flader in view of Rasmussen (United States Patent 6,944,983).

19. As to claim 6, Flader teaches everything claimed, as applied above in claim 1, with the exception of different regions of the photoelastic material differ in the amount of light they transmit. However to do so is well known as taught by Rasmussen. Rasmussen teaches different regions of the photoelastic material differ in the amount of light they transmit (column 2, lines 35-38). It would have been obvious to one of ordinary skill in the art at the time of invention to have different regions of the photoelastic material differ in the amount of light they transmit, in order to further modify the local birefringence patterns.

20. As to claim 15, Flader teaches everything claimed, as applied above in claim 1 with the exception of the shape is a prism, lens or wedge for creating various optical effects. However to do so is well known as taught by Rasmussen. Rasmussen teaches the shape is a prism, lens or wedge for creating various optical effects (Figure 6, element 170). It would have been obvious to one of ordinary skill in the art at the time of invention to have the shape be a prism, lens or wedge for creating various optical effects, in order to avoid a direct view of the light source.

21. As to claim 16, Flader teaches everything claimed, as applied above in claim 1, with the exception of the one or more polarizing films are attached on one or more outer surfaces on the photoelastic material. However to do so is well known as taught by

Rasmussen. Rasmussen teaches the one or more polarizing films are attached on one or more outer surfaces on the photoelastic material (column 2, lines 35-38). It would have been obvious to one of ordinary skill in the art at the time of invention to have the one or more polarizing films be attached on one or more outer surfaces on the photoelastic material, in order to allow the use of any desired shape.

22. As to claim 38, Flader teaches everything claimed, as applied above in claim 1, with the exception of an opaque object or a mirrored surface below, a characteristic of or embedded within the transparent or translucent photoelastic material. However to do so is well known as taught by Rasmussen. Rasmussen teaches an opaque object or a mirrored surface below, a characteristic of or embedded within the transparent or translucent photoelastic material (Figure 5, the reflective surface of element 164, including elements 168). It would have been obvious to one of ordinary skill in the art at the time of invention to have an opaque object or a mirrored surface below, a characteristic of or embedded within the transparent or translucent photoelastic material, in order to increase the visibility of the internal stress patterns.

23. As to claim 39, Flader in view of Rasmussen teaches everything claimed, as applied above in claim 38, in addition Flader teaches the polarizing films are applied on a surface of the photoelastic material or mounted separately from the photoelastic material (Figure 1, elements 12, 15 and 13 and mounted separately).

24. As to claim 40, Flader in view of Rasmussen teaches everything claimed, as applied above in claim 39, in addition Flader teaches multiple polarizing films are

Art Unit: 2877

rotated with respect to one another to control transmission of light (column 5, lines 26-39).

25. As to claim 45, Flader teaches everything claimed, as applied above in claim 1, with the exception of transparent or translucent protective coatings are applied over outer surfaces of the photoelastic material. However to do so is well known as taught by Rasmussen. Rasmussen teaches transparent or translucent protective coatings are applied over outer surfaces of the photoelastic material (column 4, lines 26-29). It would have been obvious to one of ordinary skill in the art at the time of invention to have transparent or translucent protective coatings be applied over outer surfaces of the photoelastic material, in order to prolong the useful lifetime of the device.

Claims 9, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flader.

26. As to claim 9, Flader teaches everything claimed, as applied above in claim 1, in addition the photoelastic material is a single color. While Flader does not explicitly teach a monochromatic material, Flader teaches single-material photoelastic models (column 5, lines 71-73). It is inherent that in the absence of dyes or additives, any material is of a single color. Examiner further believes that because the invention of Flader is used to produce colors as a result of stress, Flader would not include such additives in the material without explicitly stating such.

27. As to claim 25, Flader teaches everything claimed, as applied above in claim 1, in addition a thin air interface between embedded objects and the photoelastic material creates interference patterns of light. Examiner's position is that it is an inherent

property of thin air interfaces to create interference patterns of light. Examiner refers applicant to "Interferometric Thickness Measurement of Very Thin Air Gaps or Films", for a discussion on thin air gaps and the resultant interference films.

Claims 10, 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flader in view of Frocht (United States Patent 2,070,787).

28. As to claim 10, Flader teaches everything claimed, as applied above in claim 1, with the exception of the photoelastic material is different colors in different regions. However to do so is well known as taught by Frocht. Frocht teaches the photoelastic material is different colors in different regions (column 1, lines 25-31). It would have been obvious to one of ordinary skill in the art at the time of invention to have the photoelastic material be different colors in different regions, in order to create an attractive and attention-gathering display.

29. As to claim 31, Flader teaches everything claimed, as applied above in claim 1, with the exception of stress patterns are affected by one or more clamps attached to the photoelastic material. However to do so is well known as taught by Frocht. Frocht teaches stress patterns are affected by one or more clamps attached to the photoelastic material (Figure 2). It would have been obvious to one of ordinary skill in the art at the time of invention to have stress patterns be affected by one or more clamps attached to the photoelastic material, in order to ease the automation of the applied stress.

30. As to claim 32, Flader teaches everything claimed, as applied above in claim 1, with the exception of combinations of manual manipulation, springs, strings, elastic bands, clamps and force-applying devices are used to affect stress patterns. However

to do so is well known as taught by Frocht. Frocht teaches combinations of manual manipulation, springs, strings, elastic bands, clamps and force-applying devices are used to affect stress patterns (Figure 2). It would have been obvious to one of ordinary skill in the art at the time of invention to have combinations of manual manipulation, springs, strings, elastic bands, clamps and force-applying devices be used to affect stress patterns, in order to allow wide variation in the types of applied stress.

Claims 20, 23, 27, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Flader in view of Cotterman (United States Statutory Invention Registration H76).

31. As to claim 20, Flader teaches everything claimed, as applied above in claim 1, with the exception of the one or more polarizing films are disposed on individual stands for flexibility in viewing. However to do so is well known as taught by Cotterman. Cotterman teaches the one or more polarizing films are disposed on individual stands (Figure 1, elements 14a-14d) for flexibility in viewing (column 2, lines 16-19). It would have been obvious to one of ordinary skill in the art at the time of invention to have the one or more polarizing films be disposed on individual stands for flexibility in viewing, in order to allow the device to adjust the polarization (e.g. plane vs. circular).

32. As to claim 23, Flader teaches everything claimed, as applied above in claim 1, in addition the one or more polarized films are rotated with respect to one another (column 5, lines 26-39) for increasing or decreasing the amount of light passing through the photoelastic object.

Flader fails to teach the films are polaroid films. However to do so is well known as taught by Cotterman. Cotterman teaches the films are polaroid films (column 4, lines

48-50). It would have been obvious to one of ordinary skill in the art at the time of invention to have the films be polaroid films, in order to have a known and reliable type of polarization film.

33. As to claim 27, Flader teaches everything claimed, as applied above in claim 1, with the exception of stress patterns are affected by manual manipulation of the photoelastic material. However to do so is well known as taught by Cotterman. Cotterman teaches stress patterns are affected by manual manipulation of the photoelastic material (Figure 3, and column 5, lines 40-46). It would have been obvious to one of ordinary skill in the art at the time of invention to have stress patterns be affected by manual manipulation of the photoelastic material, in order to allow exploration of the stress patterns as a user desires.

34. As to claim 41, Flader teaches everything claimed, as applied above in claim 1,3 with the exception of a mirrored surface, wherein the photoelastic material is manipulated between the mirrored surface and a polarized film. However to do so is well known as taught by Cotterman. Cotterman teaches a mirrored surface (Figure 1, element 18), wherein the photoelastic material (Figure 1, below element 48) is manipulated between the mirrored surface (Figure 1, element 18) and a polarized film (Figure 1, element 28). It would have been obvious to one of ordinary skill in the art at the time of invention to have a mirrored surface, wherein the photoelastic material is manipulated between the mirrored surface and a polarized film, in order to direct the light from an overhead source into the main optical axis of observation.

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flader in view of Payne et al (United States Patent 3,331,236).

35. As to claim 34, Flader teaches everything claimed, as applied above in claim 1, with the exception of a sharp object is used to create stress patterns by contacting the photoelastic material. However to do so is well known as taught by Payne. Payne teaches a sharp object (Figure 1, element 32) is used to create stress patterns by contacting the photoelastic material. It would have been obvious to one of ordinary skill in the art at the time of invention to have a sharp object is used to create stress patterns by contacting the photoelastic material, in order to create highly localized stress patterns.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Flader in view of Issa and Maamoun (S. S. Issa and G. Maamoun "Suitability of the photoelastic implementation of polymers with material birefringence" at

<http://www.springerlink.com/content/86447gl16m223kt6/> hereafter referred to as Issa).

36. As to claim 42, Flader teaches everything claimed, as applied above in claim 1, with the exception of fixed, permanent fringes are fixed within the photoelastic object through curing techniques and permanent deformation strategies. However to do so is well known as taught by Issa. Issa teaches fixed, permanent fringes are fixed within the photoelastic object (Abstract) through curing techniques and permanent deformation strategies. It would have been obvious to one of ordinary skill in the art at the time of invention to have fixed, permanent fringes are fixed within the photoelastic object

through curing techniques and permanent deformation strategies, in order to take use the cheap, durable and low-cost advantages of Plexiglass.

Claims 1, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kriebel (United States Patent 2,120,365).

37. As to claim 1, Kriebel teaches a photoelastic entertainment device comprising deformable photoelastic material molded into shapes (Figure 2, element 22) and one or more light polarizing films (Figure 2, elements 21, 23) for viewing fringe patterns within the photoelastic materials caused by stress (column 2, lines 1-4).

While Kriebel does not explicitly state element 22 is of photoelastic material, Kriebel teaches the examination of photo-elastic effects (column 2, lines 1-4). Examiner finds this inherently dictates photoelastic materials.

38. As to claim 21, Kriebel teaches everything claimed, as applied above in claim 1, in addition a polarized light source (Figure 2, elements 23 & 24) for passing light through the photoelastic material (Figure 2, element 22) and then through a pair of polarized glasses (Figure 2, element 21).

39. As to claim 22, Kriebel teaches everything claimed, as applied above in claim 1, in addition an unpolarized light source (Figure 2, element 24) for passing light through a polarizing film (Figure 2, element 23), through a photoelastic object (Figure 2, element 23) and through a pair of polarized glasses (Figure 2, element 21).

Allowable Subject Matter

Claim 33 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

40. As to claim 33, the prior art of record, taken alone or in combination, fails to disclose or render obvious an internal cavity is molded into the photoelastic material for receiving an object larger than the cavity, thus stretching the internal cavity and creating stress patterns, in combination with the rest of the limitations of the claim.

Claims 11-12, 17, 13-14, 24, 28-30, 43-44 are allowed.

The following is an examiner's statement of reasons for allowance:

41. As to claim 11, the prior art of record, taken alone or in combination, fails to disclose or render obvious a photoelastic device wherein one or more magnets are embedded in the photoelastic material, in combination with the rest of the limitations of the claim.

42. As to claim 17, the prior art of record, taken alone or in combination, fails to disclose or render obvious the one or more polarized films are embedded within the photoelastic material, in combination with the rest of the limitations of the claim.

43. As to claim 24, the prior art of record, taken alone or in combination, fails to disclose or render obvious bubbles or colloidal particles are molded into the photoelastic

material for producing optical effects, in combination with the rest of the limitations of the claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JARREAS C. UNDERWOOD whose telephone number is (571) 272-1536. The examiner can normally be reached on Monday-Friday 0530-1400.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on (571) 272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2877

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/J. C. U./
Examiner, Art Unit 2877

Jarreas Underwood
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2/11/2008

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